USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY13 Final Performance Report
July 15, 2014

Cover Page

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Fiscal Year:	FY13
USDA-ARS Agreement ID:	59-0206-2-086
USDA-ARS Agreement Title:	Continued Deployment of Prediction Models for Fusarium Head Blight.
FY13 USDA-ARS Award Amount:	$ 31,045

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
MGMT	Continued Deployment of Prediction Models for Fusarium Head Blight.	$ 31,045
	FY13 Total ARS Award Amount	**$ 31,045**

Paul G Knight 7/6/14

Principal Investigator Date

* MGMT – FHB Management
FSTU – Food Safety, Toxicology, & Utilization of Mycotoxin-contaminated Grain
GDER – Gene Discovery & Engineering Resistance
PBG – Pathogen Biology & Genetics
BAR-CP – Barley Coordinated Project
DUR-CP – Durum Coordinated Project
HWW-CP – Hard Winter Wheat Coordinated Project
VDHR – Variety Development & Uniform Nurseries – Sub categories are below:
SPR – Spring Wheat Region
NWW – Northern Soft Winter Wheat Region
SWW – Southern Soft Red Winter Wheat Region

Project 1: *Continued Deployment of Prediction Models for Fusarium Head Blight.*

1. What major problem or issue is being resolved relevant to Fusarium head blight (scab) and how are you resolving it?

We are addressing the risk of scab development during the critical flowering stage when the growers can ameliorate the risk with treatment. This project leverages various atmospheric data networks, including the finest scale and most accurate gridded data set (RTMA), gridded model data and a host of regression based epidemiological models on a user-friendly graphic interface to assist growers in decision making in protecting their fields from scab. Using hourly reports of temperature and moisture from standard networks, agricultural networks, proxy agricultural networks (CWOP) and finely gridded data, each day the risk is assessed anew with the most recent observations and is available by mid-morning.

2. List the most important accomplishments and their impact (i.e. how are they being used) to minimize the threat of Fusarium Head Blight or to reduce mycotoxins. Complete both sections; repeat sections for each major accomplishment:

Accomplishment:

A successful daily prediction using various scab risk models have been run throughout the wheat growing season (Mar-Aug, 2013) from winter wheat in the southern Plains to late spring wheat in the Dakotas. Additional expert commentary is included from plant pathologists in most states to augment the utility of the interface. The tools are also available on mobile apps and risk in non-growing regions is now being masked to prevent misinterpretation of the risk tool.

Impact:

Growers are using the interface and models to assist in crucial decisions about the risk of scab in their region. When there are any breaks in the data stream that produces the risk assessment tool, we receive immediate response. In the previous season, we developed a virtual back-up system to reduce the occurrences of outages on the web interface. (This new system was used a couple of times in 2013).

Include below a list of the publications, presentations, peer-reviewed articles, and non-peer reviewed articles written about your work that resulted from all of the projects included in the FY13 grant. Please reference each item using an accepted journal format. If you need more space, continue the list on the next page.

Publications:

Shah, D. A., Molinero, J. E., Paul, P.A., Willyerd, K. T., Madden, L. V., and De Wolf, E. D. 2013. Predicting Fusarium head blight epidemics with weather-driven pre- and post-anthesis logistic regression model. Phytopathology 103:906-919.

Presentations:

De Wolf, E., Paul, P. Crawford, S., Hane, D., Canty, S., Van Sanford, D., Knight, P., and Miller, D. 2013. Impact of prediction tools for Fusarium Head Blight in the US, 2009-2013. In: S. Canty, A. Clark, Y. Salat and D. Van Sanford (Eds.), Proceedings of the 2013 National Fusarium Head Blight Forum (pp. 106). East Lansing, MI/Lexington, KY: U.S. Wheat & Barley Scab Initiative.